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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,307	02/24/2004	Hiroshi Tabata	P69530US0	8302

7590 03/21/2007  
JACOBSON HOLMAN  
PROFESSIONAL LIMITED LIABILITY COMPANY  
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Washington, DC 20004

EXAMINER
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MUHAMMED, ABDUKADER S

ART UNIT	PAPER NUMBER
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2627

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/784,307

Applicant(s)

TABATA ET AL.

Examiner

Abdukader Muhammed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Mizuno et al. (US 6,996,052 B1).

Regarding Claim 1, Mizuno et al. teach an optical disk comprising: a substrate (substrate 1; see figure 5(a) and column 14, lines 62-67); a first protective layer (first protective layer 2; see figure 5(a) and column 14, lines 62-67) formed on the substrate; a recording layer (recording layer 3; see figure 5(a) and column 14, lines 62-67) formed on the first protective layer; a second protective layer formed on the recording layer (second protective layer 4; see figure 5(a) and column 14, lines 62-67); and a reflective layer formed on the second protective layer (reflective layer 5; see figure 5(a) and column 14, lines 62-67), wherein the recording layer includes a composition expressed as  $(\text{Sb}_{\text{sub.x}}\text{Te}_{\text{sub.1-x}})_{\text{sub.a}}\text{Ge}_{\text{sub.b}}\text{In}_{\text{sub.c}}$  in which atomic ratios are  $0.77 \leq x \leq 0.84$ ,  $0.85 \leq a \leq 0.95$ ,  $0.01 \leq b \leq 0.10$  and  $0.01 \leq c \leq 0.10$  where  $a+b+c=1$ . Note:

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this gives atomic ratio of  $.6545 \leq \text{Sb} \leq 0.789$ ,  $0.136 \leq \text{Te} \leq 0.3135$ ,  $0.01 \leq \text{Ge} \leq 0.1$ , and  $0.01 \leq \text{In} \leq$

0.1. Mizuno et al. teach this composition for recording layer given as, In (0.023) Ge (0.048) Sb (0.719) Te (0.21) with the sum of 1 or 100% atomic ratio (see column 57, lines 5-10).

Regarding Claim 2, as applied to claim 1 above and Mizuno et al. further teach that the atomic ratios "b" of Ge and "c" of In have a difference  $-0.05 \leq b-c \leq 0.05$  (from the above data, In (0.023) Ge (0.048) Sb (0.719) Te (0.21),  $0.023-0.048 = -0.025$  which is in the range given (see column 57, lines 5-10).

Regarding Claim 3, as applied to claim 1 above and Mizuno et al. further teach that the recording layer includes at least one element selected from the group consisting of Ag, Si, Al, Ti, Bi and Ga, the selected element having 3 atom % or less in the recording layer (Addition of Si less than 5%; see column 17, lines 60-61. Addition of Al and Ga less than 8%; see column 17, lines 65-67).

Regarding Claim 4, as applied to claim 1 above and Mizuno et al. further teach that the reflective layer includes Ag as a major component of the reflective layer (Ag alloy containing from 0.2 atomic % to 5 atomic % of Ti, V, Ta, Nb, W, Co, Cr, Si, Ge, Sn, Sc, Hf, Pd, Rh, Au, Pt, Mg, Zr, Mo or Mn in Ag, is also preferred; see column 23, lines 30-33).

Regarding Claim 5, as applied to claim 1 above and Mizuno et al. further teach that the substrate has a spiral groove or concentric grooves with a depth of  $20 \text{ nm} \leq \text{depth} \leq 30 \text{ nm}$  (spiral groove with 30 nm; see column 43, lines 55-59 and claim 22).

4. Claims 1-2, and 4-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada et al. (US Publication 2001/0017833 A1).

Regarding Claim 1, Yamada et al. teach an optical disk comprising: a substrate (substrate 1; see figure 4 and page 4, paragraph [0096], lines 3-7); a first protective layer (first dielectric layer 2; see figure 4 and page 4, paragraph [0096], lines 3-7) formed on the substrate; a recording layer (recording layer 3; see figure 4 and page 4, paragraph [0096], lines 3-7) formed on the first protective layer; a second protective layer formed on the recording layer (second dielectric layer 4; see figure 4 and page 4, paragraph [0096], lines 3-7); and a reflective layer formed on the second protective layer (metal or alloy layer 5 which serves as reflective heat dissipation layer; see figure 4 and page 4, paragraph [0096], lines 3-7 also page 6, paragraph [0152], lines 4-7), wherein the recording layer includes a composition expressed as  $(\text{Sb}_{\text{sub.x}}\text{Te}_{\text{sub.1-x}})_{\text{sub.a}}\text{Ge}_{\text{sub.b}}\text{In}_{\text{sub.c}}$  in which atomic ratios are  $0.77 \leq x \leq 0.84$ ,  $0.85 \leq a \leq 0.95$ ,  $0.01 \leq b \leq 0.10$  and  $0.01 \leq c \leq 0.10$  where  $a+b+c=1$ . Note: this gives atomic ratio of  $.6545 \leq \text{Sb} \leq 0.789$ ,  $0.136 \leq \text{Te} \leq 0.3135$ ,  $0.01 \leq \text{Ge} \leq 0.1$ , and  $0.01 \leq \text{In} \leq 0.1$ . Yamada et al. teach this composition for recording layer given in percentage form as,  $55 \leq \text{Sb} \leq 70$ ,  $22 \leq \text{Te}$ ,  $0 \leq \text{Ge} \leq 10$ , and  $2 \leq \text{In} \leq 10$  with the sum of 100% atomic ratio (see page 3, paragraphs [0070] through [0075]).

Regarding Claim 2, as applied to claim 1 above and Yamada et al. further teach that the atomic ratios "b" of Ge and "c" of In have a difference  $-0.05 \leq b-c \leq 0.05$  (from the above data,  $55 \leq \text{Sb} \leq 70$ ,  $22 \leq \text{Te}$ ,  $0 \leq \text{Ge} \leq 10$ , and  $2 \leq \text{In} \leq 10$ ,  $0-2=-2 \leq \text{atomic \% "Ge"} - \text{atomic \% "In"} \leq 12-10=2$  which is in the range given (see page 3, paragraphs [0070] through [0075]). Note that in Yamada et al. the ratios are in percentage form.

Regarding Claim 4, as applied to claim 1 above and Yamada et al. further teach that the reflective layer includes Ag as a major component of the reflective layer (as the material for the

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metal or alloy layer, there can be employed metal materials such as Al, Au, Ag, Cu and Ta and alloys thereof; see page 6, paragraph [0152], lines 1-7).

Regarding Claim 5, as applied to claim 1 above and Yamada et al. further teach that the substrate has a spiral groove or concentric grooves with a depth of  $20 \text{ nm} \leq \text{depth} \leq 30 \text{ nm}$  (guide grooves formed in the substrate have a depth of  $150 \text{ \AA} = 15 \text{ nm}$  to  $550 \text{ \AA} = 55 \text{ nm}$ , more preferably  $200 \text{ \AA} = 20 \text{ nm}$  to  $450 \text{ \AA} = 45 \text{ nm}$ ; see page 4, paragraph [0098], lines 4-7).

5. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Horie et al. (US Publication 2002/0160305 A1).

Regarding Claim 1, Horie et al. teach an optical disk comprising: a substrate (substrate; see figure 19A); a first protective layer (dielectric protective layer; see figure 19A) formed on the substrate; a recording layer (recording layer; see figure 19A) formed on the first protective layer; a second protective layer formed on the recording layer (dielectric protective layer; see figure 19A); and a reflective layer formed on the second protective layer (reflective layer; see figure 19A), wherein the recording layer includes a composition expressed as  $(\text{Sb}_{.sub.x}\text{Te}_{.sub.1-x})_{.sub.a}\text{Ge}_{.sub.b}\text{In}_{.sub.c}$  in which atomic ratios are  $0.77 \leq x \leq 0.84$ ,  $0.85 \leq a \leq 0.95$ ,  $0.01 \leq b \leq 0.10$  and  $0.01 \leq c \leq 0.10$  where  $a+b+c=1$ . Note: this gives atomic ratio of  $.6545 \leq \text{Sb} \leq 0.789$ ,  $0.136 \leq \text{Te} \leq 0.3135$ ,  $0.01 \leq \text{Ge} \leq 0.1$ , and  $0.01 \leq \text{In} \leq 0.1$ . Horie et al. teach this composition for recording layer given in percentage form as, In (3) Ge (5) Sb (71) Te (21) with the sum of 100% atomic ratio (see page 18, paragraph [0219], lines 4-6).

Regarding Claim 2, as applied to claim 1 above and Horie et al. further teach that the atomic ratios "b" of Ge and "c" of In have a difference  $-0.05 \leq b-c \leq 0.05$  (from the above data,

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In (3) Ge (5) Sb (71) Te (21),  $5\%-3\% = 2\%$ , *in fraction form it is 0.02* which is in the range given in the instant invention (see page 18, paragraph [0219], lines 4-6).

Regarding Claim 3, as applied to claim 1 above and Mizuno et al. further teach that the recording layer includes at least one element selected from the group consisting of Ag, Si, Al, Ti, Bi and Ga, the selected element having 3 atom % or less in the recording layer (for securing formation of a hexagonal crystal single phase, the total amount of the other elements is preferably not more than 3 atom %; see page 6, paragraph [0086], lines 1-5. For the list of elements see 6, paragraph [0080] and for a complete detail see paragraph [0080] through [0086]).

Regarding Claim 4, as applied to claim 1 above and Mizuno et al. further teach that the reflective layer includes Ag as a major component of the reflective layer (the reflective layer is preferably made of a material having a high reflectance, particularly a metal such as Au, Ag or Al of which a heat dissipation effect is expected; see page 16, paragraph [0193], lines 1-3).

Regarding Claim 5, as applied to claim 1 above and Mizuno et al. further teach that the substrate has a spiral groove or concentric grooves with a depth of  $20\text{ nm} \leq \text{depth} \leq 30\text{ nm}$  (substrate is usually provided with guiding grooves having a depth of about 10 to 80 nm; see page 15, paragraph [0183], lines 4-6).

### ***Conclusion***

6. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

Ohno et al. (US 6004646) teach an optical information recording medium for recording, retrieving and erasing mark length-modulated amorphous marks, which comprises a substrate,

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and a lower protective layer, a phase-change recording layer, an upper protective layer and a reflective layer formed in this sequence on the substrate. For composition of the recording layer see column 7, lines 1-5.

Abiko et al. (US 2002/0018869 A1) teach an optical information recording medium with a first dielectric film, phase recording film, second dielectric film, reflection film and protective film are sequentially formed on a disc substrate having formed lands, grooves and wobbling on one major surface. The recording film is made of a GeInSbTe alloy, and the reflection film is made of an AgPdCu alloy.

Kato et al. (US 2002/0064117 A1) teach an optical recording media capable of recording information at a high density and erasing the recorded information for overwriting. For composition of the recording layer see page 10, paragraph [0149].

Nobukuni et al. (US 6661760 B2) teach a phase change type optical recording medium recorded by the optical recording method, the phase change type optical recording medium having a recording layer made of  $M_{\text{sub}.z} \text{Ge}_{\text{sub}.y} (\text{Sb}_{\text{sub}.x} \text{Te}_{\text{sub}.1-x})_{\text{sub}.1-y-z}$  alloy. For composition of the recording layer see column 6, lines 30-36.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdukader Muhammed whose telephone number is (571) 270-1226. The examiner can normally be reached on Monday-Thursday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. Customer Service can be reached



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at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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15 March 2007

  
WAYNE YOUNG  
SUPERVISORY PATENT EXAMINER